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INCH-POUND  
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PERFORMANCE SPECIFICATION  
FOR THE  
ELECTRIC ARMOR MOVING TARGET CARRIER

1. **SCOPE.** This specification covers the performance and verification requirements for an Electric Armor Moving Target Carrier (EAMTC) to be used as a vehicle that transports a target lifting device(s) with a full scale armor flank target (see Appendix A) and an Armor Hostile Fire Simulator. This EAMTC will be a direct replacement for the Armor Moving Target Carrier assembly (AMTC) (P/N 9365721-1) currently used on the Remote Target System (RETS) ranges. The EAMTC requirements can be met by supplying an entire carrier unit with Target Lifter, Hostile Fire Simulator, Target Kill Simulator and Remote Controller or a modification kit for the current AMTC unit.

2. **APPLICABLE DOCUMENTS.**

2.1 **General.** The documents listed in this section are referenced in Section 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, documents users are cautioned they must meet all specified requirements as cited in Section 3 and 4 of this specification, whether or not they are listed.

2.2 **Government Documents.** The following specifications, drawing, and standard of the exact revision listed below form a part of this specification to the extent specified herein.

**Specifications.**

MIL-STD-130H

- Identification Marking of U.S. Military Property

**Drawings:**

9365721-1

- Armor Moving Target Carrier (AMTC)  
(Reference only)

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. Copies of National and International Standards are available from American National Standards Institute, ATTN: Customer Service, 11 West 42nd Street, New York, NY 10036 or <http://www.ansi.org>).

## **2.3 Other Documents.**

ANSI/IPC J-STD-001 - Requirements of Soldered Electrical and Electronic Assemblies

**2.4 Order of Precedence.** In the event of conflict between the text of this document and the references cited, the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations.

## **3.0 OPERATIONAL AND PERFORMANCE REQUIREMENTS.**

**3.1 First Article.** When specified (see 6.2), EAMTC shall be subjected to First Article inspection in accordance with 4.1.2.

**3.2 Material and Processes.** Unless otherwise specified, the design, materials and manufacturing process selection shall be the prerogative of the contractor as long as all articles submitted to the Government fully meet the operating interface, ownership and support, and operating environment requirements of this specification. Soldering shall be in accordance with the requirements at ANSI/IPC J-STD-001.

### **3.3 Operating Requirements.**

**3.3.1 General Description.** The EAMTC simulates a tank or other vehicle for live fire training and qualification programs. It provides training in detecting, identifying, and firing upon moving tank targets under simulated combat conditions. The EAMTC will be an electric powered, functional equivalent to the hydraulic carrier, P/N 9365721. It will interface with the RETS. As a minimum, the EAMTC will operate of the ERETS control systems.

#### **3.3.2 Performance Requirements.**

**3.3.2.1 Input power.** If external power is used, the EAMTC shall be capable of operating from either of the following power sources.

- a. 480 VAC  $\pm$  10%, 60 Hz, Three phase, maximum load 75KVA
- b. 380 VAC + 10%, 50 Hz, Three phase, maximum load 75 KVA (with motors that can operate on this power).

#### **3.3.2.2 Speeds.**

**3.3.2.2.1 Flat terrain.** One of three speeds in either forward or reverse direction shall be selected, 10,15, 20 km/hr. The selected speed must be maintained within  $\pm$  5% on flat terrain while the target is raised or lowered with a 55km/hr wind load in any direction.

**3.3.2.2.2 Five Percent Slope Speed.** The speed selected must be maintained within 5 km/hr while climbing a five percent slope with no wind load.

**3.3.2.3 Acceleration/Deceleration.**

**3.3.2.3.1 Accelerate - Flat track.** The EAMTC shall accelerate from 0 to  $20 \pm 2.5$  km/hr within 40 meters on flat terrain with no wind load.

**3.3.2.3.2 Decelerate - Flat track.** The EAMTC shall decelerate from  $20 \pm 2.5$  km/hr to a stop within 10 meters on flat terrain with no wind load. The carrier shall be slowed or stopped by dynamic braking through the motor controller.

**3.3.2.3.3 Accelerate - 10 Percent Slope.** The carrier shall accelerate from 0 km/hr to 20 km/hr within 100 meters on 10 percent slope.

**3.3.2.4 Curved track.** The carrier shall travel along a curved track at any selected speed as specified by 3.4.1.2. The radius of the bend shall be 500 feet or more.

**3.3.2.5 Positive brake.** The carrier shall have a positive brake that will hold it stationary at any point on the track on a 10% slope until commanded to move.

**3.3.2.6 Duty cycle.** The EAMTC shall be capable of operating one cycle every seven minutes. Attempts to operate more frequently shall not cause hardware failure. A cycle is defined as:

1. Raising the target
2. Travel at the selected speed from one end of the track to the other
3. Lowering the target
4. Returning at the selected speed to the starting position.

**3.3.2.7 Power loss operation.** In the event of a loss of power to the EAMTC, the EAMTC shall execute electrical braking to stop the EAMTC within 10 meters.

**3.3.2.8 Maintenance interface.** An on-carrier maintenance test switch shall be provided that permits the EAMTC to be moved in either direction for a short distance. The switch will operate only if the motor controller enclosure door interlock is in the open position.

**3.3.2.9 Movement signals.** The command signals for the EAMTC are the same as for the AMTC system with the exception of response to safety interlocks. The commands given below are defined by the ERETTS Range Control Station (RCS).

**3.3.2.9.1 Speed commands.** The speed commands are as defined by the RCS. When a safety interlock is activated in the controller, the EAMTC will not execute move commands but will give an indication that a move command has been received.

**3.3.2.9.2 Stop command.** When asserted, the carrier shall execute a stop. Other motion commands will be ignored if this signal is asserted.

**3.3.2.9.3 Forward command.** This command will cause the carrier to move in the forward direction when asserted if the following conditions are met.

- a. The carrier is not at the forward end of track.
- b. The stop command is not present.
- c. The control box interlock is closed.
- d. An appropriate speed command is present.

**3.3.2.9.4 Reverse Command.** This command will cause the carrier to move in the reverse direction when asserted if the following conditions are met.

- a. The carrier is not at the reverse end of track.
- b. The stop command is not present.
- c. The control box interlock is closed.
- d. An appropriate speed command is present.

**3.3.2.9.5 Forward Limit.** The forward limit is asserted when the forward limit is reached and will initiate a stop command.

**3.3.2.9.6 Reverse Limit.** The reverse limit signal is asserted when the reverse limit is reached and will initiate a stop command.

**3.3.2.10 Target Signals.** Commands to the Target Lifter for target control as defined by the ERETS RCS.

**3.3.2.10.1 Up Command.** The up command is as defined in 3.4.1.2. The Target Lifter will raise the target when this command is asserted.

**3.3.2.10.2 Down Command.** The down command is as defined in 3.4.1.2. The Target Lifter will lower the target when this command is asserted.

**3.3.2.10.3 Up Limit.** The up limit indication is as defined in 3.4.1.2. The signal is

asserted when the target is at the up limit.

**3.3.2.10.4 Down Limit.** The signal is asserted when the target is at the down limit and will terminate lowering.

**3.3.2.11. Hit Signal.** The Hit signal will be compatible with the RCS and will cause the target to lower when in the single hit mode.

**3.3.2.12 TKS Command.** When this signal is asserted, a TKS fire signal will be asserted.

**3.3.2.13 AHFS Command.** When this signal is asserted, and AHFS fire signal will be asserted.

**3.3.2.14 Thermal Target.** When this signal is asserted, 110VAC power will be provided for thermal targets thru connector style NEMA.

**3.3.2.15 Parking Brake.** The carrier shall be equipped with an automatic parking brake to hold the carrier in place when stopped. A manual override of the brake shall be provided to permit the carrier to be moved manually.

**3.3.2.16 Limit Switches.** The carrier shall utilize on-board travel limit switches to detect plates placed between the rails at either end of the track. To minimize carrier overrun potential at the track ends, the carrier shall have a distance encoder to supplement the normal travel limit switches. The encoder shall signal the carrier to stop if the carrier travels further than the programmed travel distance. The encoder shall be easily programmable for various track lengths.

**3.3.2.17 Vehicle Framework.** The carrier vehicle framework shall be suitably finished to withstand weathering without corrosion.

**3.3.2.18 ERETS Controller.** The supplier of a complete EAMTC shall have available an optional interface device to allow control by an existing ERETSC computer system. This control may be in lieu of a Portable Range Controller. This requirement is not applicable to AMTC Modification Kit.

**3.3.2.18.1 Portable Range Controller.** A portable, programmable Range Controller (RC) shall be furnished which allows the operator to command direction of travel, target expose/conceal, number of hits required to "kill" the target, and hit attributes.

a. The RC shall allow remote hit sensitivity adjustment to allow for various types of ammunition to be fired at the target.

b. The RC shall communicate with the carrier via two-way radio link. The RC shall send various command to the carrier and receive status and hit count for display.

c. The RC shall operate from its own rechargeable battery pack. The battery pack shall include its own charger.

d. The RC shall be capable of storing 100 scenarios and allow the operator to enter, edit, store to memory, recall from memory, delete from memory and execute (run) programs.

e. Previously stored scenarios shall be retained in memory in the event of loss of power or by turning off the RC for a minimum of 6 months.

f. The RC shall be capable of controlling up to 200 individual targets.

**3.3.2.19 Fuel/Refueling.** Units requiring on board fuel shall have fuel capacity for at least 24 hours of operation at full duty cycle. Refueling shall not require more than 15 minutes to accomplish assuming availability of refueling supply. In lieu of on board fuel, replacement battery packs may be employed if required duty cycle can be maintained.

### **3.4 INTERFACE REQUIREMENTS.**

**3.4.1 Electrical.** This section applies to systems using the existing bus bars.

**3.4.1.1 Input Power:** If external power is needed, the EAMTC shall interface with power as required by 3.3.2.1.

**3.4.1.1.1 Power Pickup.** If required, electrical power is received via power pickup brushes. Phase A is track side and phase C is berm side. Phase B is middle pickup.

**3.4.1.2 Carrier Control Interface.** The control input point for the EAMTC is ERETS PC or the Target Interface Unit (TIU) via the W11 Cable. The pin definition for the cable connector is provided in table 3.4.1.2-a. The signals applicable to this connector shall be defined as follows when referenced to pin F:

- a. High      Positive 9.5 + 1.0 VDC
- b. Low        0 + 0.5 VDC

**Table 3.4.1.2-a W11 Cable Interface**

<u>Input pin</u>	<u>Signal</u>	<u>Active state</u>
J3-f	Hit	Pulse, positive, 25 ± 5mSecs
J3-H	Thermal target	High
J3-Y	Target DOWN limit	Low
J3-d	Target DOWN command	High
J3-X	Target UP limit	Low
J3-B	Target UP command	High

J3-K	Reverse direction cmd	Low
J3-J	Forward direction cmd	Low
J3-F	Signal ground	
J3-T	Speed 4	Low
J3-W	TKS command	Low
J3-j	AHFS command	Low
J3-L	Forward limit	Low
J3-M	Reverse limit	Low
J3-N	Stop	Low
J3-P	Speed 1	Low
J3-R	Speed 2	Low
J3-S	Speed 2	Low

**3.4.2 RCS interface.** Systems not using the bus bars must interface with the RCS by other data link and be capable of updating status of targets.

**3.4.3 Mechanical.** The EAMTC has the same mechanical interface as the AMTC. The carrier shall travel on standard guage, 56.5 inch (143.5 cm), 25 lbs/yd, railroad rails. The carrier shall be equipped with integral lifting eyes on vehicle frame.

#### **3.4.4 Markings.**

**3.4.4.1 ID Plate.** An identification plate shall clearly identify the unit as follows. Information shall be in 12 point type.

**Electric Armor Moving Target Carrier**  
**Part Number - MIL-PRF-XXXX**  
**Manufacturer**  
**CAGE Code**  
**Contract No.**

**3.4.4.2 Connector, Switch Markings** Identifying markings shall be legibly and permanently applied at the connector, switch and other needed marking locations in accordance with MIL-STD-130H.

**3.4.5 Electromagnetic Compatibility.** The operational performance of the EAMTC and its subsystems shall not be degraded, nor shall malfunction occur when all systems and subsystems are working together at their normal design capability. When external power is used, the EAMTC will be compatible with the quality of power available at Army Training Ranges.

**3.4.5.1 Power Line Conducted Susceptibility.** When external power is used, the EAMTC shall not exhibit any malfunction or deviation from specification requirements when signals as specified by figures 3 and 4 are induced onto the power lines using a

standard 50 ohm Power Lines Impedance Stabilization Network.

**3.4.6 Environmental Compatibility.** All materials and processes used in the manufacture of the TTM with equipment shall be consistent with environmental best management practices and comply with all Federal environmental, health and safety regulations.

### **3.5 OWNERSHIP AND SUPPORT REQUIREMENTS.**

**3.5.1 Reliability (Operating).** The EAMTC when cycled as defined below shall have a Mean Cycle Between Failure of 5,000 cycles. A cycle is defined as:

- a. Starting from a standstill
- b. Attainment of specified speed.
- c. Target being raised and lowered.
- d. EAMTC stop at opposite end of track.

**3.5.1.1 Failures.** Failure of the AMTC to respond to a command, and/or to transmit a command to auxiliary equipment or to respond to a response from auxiliary equipment constitutes a failure.

**3.5.2 Safety.** The following are safety hazards on the EAMTC. Each hazard has a specific feature to minimize the hazard.

**3.5.2.1 Automatic Movement.** Movement of the EAMTC can be commanded remotely. A move warning indicator (aural) shall signal any impending movement of the EAMTC. An interlock switch shall prevent remotely commanded movement when the controller assembly is open for maintenance.

**3.5.2.2 Power Loss.** Power to the EAMTC can be interrupted by a variety of mechanisms. If the EAMTC is moving, then it must come to a controlled stop. The power loss operation specification 3.3.2.7 provides the controlled stop in the event of power loss.

**3.5.3 Technical Data, Manuals.** The EAMTC shall be repairable; each EAMTC shall be provided with an associated operator and maintenance manuals which include sufficient detail to operate, trouble shoot, maintain and repair the device. A complete copy of the electrical schmatic shall be included. The delivered manual shall be manufacturer published. Parts lists shall provide complete part identification, part numbers, quantity, description and ordering information to include vendors and alternate sources.



### **3.6 OPERATING ENVIRONMENTAL REQUIREMENTS.**

**3.6.1 Environmental Protection and Protective Finishes.** Selection of attachment hardware, chassis metals and finishes shall be based on proven corrosion engineering principles to assure mating surface compatibility and protection against severe environmental conditions. Exterior color and finish shall be as follows.

**3.6.1.1 Exterior Color.** A single color shall be used for all exterior surfaces. A shade desert tan or white shall be used for new units. AMTC Kits for conversion shall use Forest Green as defined by FED-STD-595.

**3.6.1.2 Exterior Surfaces.** Exterior metal surfaces shall be finished to provide high resistance to ultraviolet radiation. The processes used to apply exterior finishes shall define cleaning and pretreatment to assure optimum adherence of the primer, and drying time and conditions to assure optimum adherence of the topcoat.

#### **3.6.2 Temperature.**

**3.6.2.1 Operating.** The EAMTC shall meet all the requirements of 3.3 when stabilized thermally at -10 degrees Fahrenheit and +125 degrees Fahrenheit.

**3.6.2.1 Non-Operating (Storage).** The EAMTC shall meet the requirements of 3.3 after being subjected to at least two hours at each temperature extreme of -40 degrees Fahrenheit, +160 degrees Fahrenheit.

**3.6.3 Shock.** The EAMTC Control Electronics shall operate as specified while being subjected to 10 shock impulses having an acceleration of 30 gravity units (G) and a pulse duration of  $11 \pm 1$  milliseconds on each of the three orthogonal enclosure planes.

**3.6.4 Moisture.** The EAMTC shall operate as specified when stabilized in a condensing atmosphere at ambient temperature for 48 hours. Corrosion shall not appear.

**3.6.5 Rain Test (Non-Operating).** The EAMTC shall meet the requirements of 3.3 after being subjected to blowing rain of  $5 \pm 1$  inches per hour for one hour with wind velocity of 35 MPH directed with equal time against each of the EAMTC enclosure exposed side.

### **4. VERIFICATION**

**4.1 General.** The final inspection of the EAMTC shall be performed at the factory in accordance with the terms of the contract. Unless otherwise specified herein, quality provisions shall ensure quality throughout all areas of the specification requirements, including fabrication, processing, assembly inspection, test, preparation for delivery, and shipping.

**4.1.1 Responsibility for inspection and acceptance.** Unless otherwise specified in the contract or purchase order, the supplier is responsible for all inspection and quality conformance testing requirements specified herein. Except as specified in the contract or purchase order, the supplier may use any facilities suitable for the inspection requirements specified herein. The final inspection and acceptance by the Government will be based only on a certificate of conformance to the drawing and specification requirements and satisfactory completion of the performance test requirements of table 4-1 or appropriate for First Article or acceptance of the EAMTC.

**4.1.2 Special tests and examinations.** Examinations and tests shall be performed to satisfy the requirements of sections 3 and 5 of this document. Tests conducted shall be as shown in table 4-1.

**Table 4-1 Requirements Verification Table**

Requirement		Test Procedure	First Article	Acceptance
Description	Section	Section		
<b>Performance</b>				
Input power	3.3.2.1	4.2.3.1	X	
Flat terrain speed	3.3.2.2	4.2.3.2	X	
5% Slope speed	3.3.2.2.2	4.2.3.3	X	
Accelerate - flat track	3.3.2.3.1	4.2.3.4	X	
Decelerate - flat track	3.3.2.3.2	4.2.3.5		
Curved track	3.3.2.4	4.2.3.6	X	
Positive brake	3.3.2.5	4.2.3.7	X	
Duty cycle	3.3.2.6	4.2.3.8	X	
Power loss operation	3.3.2.7	4.2.3.9	X	
Maintenance interface	3.3.2.8	4.2.3.10	X	
Speed commands	3.3.2.9.1	4.2.3.11	X	X
Stop command	3.3.2.9.2	4.2.3.12	X	X
Forward command	3.3.2.9.3	4.2.3.13	X	X
Reverse command	3.3.2.9.4	4.2.3.14	X	X

Forward limit	3.3.2.9.5	4.2.3.15	X	X
Reverse limit	3.3.2.9.6	4.2.3.16	X	X
Target Signals	3.3.2.10			
Up command	3.3.2.10.1	4.2.3.17	X	X
Down command	3.3.2.10.2	4.2.3.18	X	X
Up limit	3.3.2.10.4	4.2.3.19	X	X
Down limit	3.3.2.10.4	4.2.3.20	X	X
Hit signal	3.3.2.11	4.2.3.21	X	X
TKS command	3.3.2.12	4.2.3.22	X	X
AHFS command	3.3.2.13	4.2.3.23	X	X
<b>Requirement</b>		<b>Test Procedure</b>	<b>First Article</b>	<b>Acceptance</b>
<b>Description</b>	<b>Section</b>	<b>Section</b>		
<b>Performance</b>				
Thermal target	3.3.2.14	4.2.3.24	X	X
Automatic movement indicator	3.5.2.1	4.2.3.25	X	X
DC power failure	3.5.2.2	4.2.3.26	X	X
<b>Environmental</b>				
Temperature	3.6.2	4.2.2.7.1	X	
Shock	3.6.3	4.2.2.7.4	X	
Moisture	3.6.4	4.2.2.7.5	X	
Rain	3.6.5	4.2.2.7.2	X	
EMI	3.4.5	4.2.2.7.3	X	

**4.1.2.1 First Article tests.** When the contract request First Article tests, each First Article sample of three units shall be subjected to the tests specified in table 4-1.

**4.2 Quality conformance test.** The contractor shall conduct an acceptance test per table 4-1 which shall include all inspections and tests necessary to verify that all functional requirements of this inspection have been achieved in terms of item, material

and/or processes offered for acceptance. The test shall be performed using a sample of one of every 50 units produced or once a month whichever comes first.

#### **4.2.1 Examinations.**

**4.2.1.1 Inspection equipment.** Except as otherwise provided by the contract, the contractor shall supply and maintain inspection equipment in accordance with the applicable requirements of the contract. Prior to acceptance, inspection equipment designs shall be submitted and approved by the Government if required by the contract.

**4.2.1.1 Submission of vendor inspection equipment designs for approval.** Submit two copies of design as required to the address specified on the contract data requirements list in the contract.

#### **4.2.2 Environmental tests.**

**4.2.2.1 Test method.** The test article shall be subjected to the environmental conditions specified by this document and shall be subjected to the test criteria for the appropriate environmental functional tests. Such tests shall also be performed following exposure to a given environment at ambient conditions. The post test for any given environment may serve as the pretest for the succeeding environment.

**4.2.2.2 Environmental function test.** The following stimuli and monitors will be performed using a simulator as required to verify responses.

**4.2.2.2.1 Simulated inputs.** The command signals in the following table can be provided by the simulating test box at the Bunker PDCU input (J3) for design based on AMTC configuration. New designs will provide similar inputs.

<u>Item</u>	<u>Command signal</u>
1	UP
2	DOWN
3	AHFS
4	TKS
5	THERMAL
6	SPEED
7	STOP
8	DIRECTION

**4.2.2.2.2 Status monitoring.** The following status monitors will be provided by the simulating test box at the Bunker PDCU input (J3) for designs based on AMTC configuration. New designs will provide equivalent monitoring.

<u>Item</u>	<u>Status monitor</u>
1	STOP
2	DIRECTION
3	DOWN
4	UP
5	LIMIT SENSING
6	HIT COUNT

**4.2.2.3 Test equipment.** The test equipment required for the environmental testing of the EAMTC shall be as specified by the Environmental Functional Test Procedure.

**4.2.2.4 Initial conditions.** Prior to conducting the environmental test, the pre-test procedure specified by the Environmental Functional Test Procedure shall be performed.

**4.2.2.5 Test procedures.** Data from the functional tests shall be recorded before, during and after the environmental tests as applicable. Performance of operating tests can be accomplished with no load by jacking the unit off the floor.

**4.2.2.6 Failure criteria.** A test article shall have failed the test when any of the following occur:

1. Deviation of monitored parameters beyond limits
2. Catastrophic or structural failure
3. Mechanical binding or loose parts (to include screws and fasteners).
4. Malfunction of test article
5. Degradation of performance beyond the limits specified
6. Deterioration, corrosion or change in tolerance limits of any external or internal part that would likely prevent the test article from meeting operational service or maintenance requirements.

A failure of the test article during one environmental test is not cause to terminate the environmental test program. If a failure occurs, the operating test step being performed during environment shall be repeated five times. If no further failures occur, then the

article is considered as having passed the test and the next test will be performed. If another failure occurs, then the test article will have failed the test step. The test article shall be returned to ambient and tested in accordance with the present procedure. If the test article passes this test, then the next environmental test shall be performed. At the conclusion of the test sequence, the nature of the failure will be determined; after corrective action has been made, the environmental test during which the article failed shall be repeated.

**4.2.2.7 Synopsis of procedures.** A synopsis of each environmental test procedure is provided.

**4.2.2.7.1 Temperature.** Temperature testing of the EAMTC control electronics assembly may be conducted with the assembly mounted on the carrier or removed from the carrier to fit in a test chamber. Connect all test circuits to the test article and perform pretest. Subject the Test Article to three continuous 24 hour cycles of simulated solar temperature. Remove the test articles from the test chamber and post test the articles as soon as the test article is removed.

**4.2.2.7.2 Rain.** Install EAMTC in test chamber. Connect all test cables and perform pretest as specified. Turn off all power to test article. Expose one side of the test article to  $5.0 \pm 1.0$  inches per hour for 30 minutes with a wind load of 55 km/hr. Expose the other three sides to the preceding rain and wind loads. Total test time shall not be less than two hours. At the conclusion of the test, inspect the interior of the electronics enclosures for entry of water. Perform post test as specified.

**4.2.2.7.3 EMI specified power line signals.** Monitor EAMTC for malfunctions.

**4.2.2.7.4 Shock.** The EAMTC controller assembly shall be subjected to shock impulses while dismounted from the carrier. Pretests and post tests shall be performed per factory acceptance tests. Perform the pretest. Subject the test article to the shock. Perform post test.

**4.2.3 Quality conformance test.** Acceptance test requirements shall be verified *after assembly of the EAMTC.*

**4.2.3.1 Input power.** When external power is used, the requirement of 3.2.1.1-a will be verified using the appropriate power at the manufacturer's plant. For Euro power versions, the requirement of 3.2.1.1-b must be verified at the installation site.

**4.2.3.2 Flat terrain speed.**

- a. Position the EAMTC on a track and command appropriate movement.
- b. Observe the carrier speed with a speed RADAR gun or other suitable

speed measuring method.

- c. The carrier speed shall be maintained within  $\pm 5\%$ .

#### **4.2.3.3 Five percent speed.**

- a. Accelerate the carrier to the maximum speed on a flat section of track.
- b. Position the EAMTC to start movement at the beginning of the segment.
- c. Command a speed of 20 km./hr.
- d. The speed shall be 20km/hr  $\pm$  5km/hr.

#### **4.2.3.3.4 Accelerate - flat track.**

- a. On a flat section of track, measure a 40 meter segment.
- b. Position the EAMTC to start movement at the beginning of the segment.
- c. Command a speed of 20 km/hr.
- d. Measure the speed attained at the end of the segment.
- e. The speed shall be 20  $\pm$  2.5 km/hr at the end of the segment.

#### **4.2.3.5 Decelerate - flat track.**

- a. On a flat terrained track, measure a 40 meter segment starting at one end of the track.
- b. Command the EAMTC to 20 km/hr so that at the EAMTC has a speed of 20 km/hr at the start of the EOT segment.
- c. The EAMTC will decelerate upon sensing the EOT rail.
- d. The EAMTC will stop before the end of the 40 meter segment.

#### **4.2.3.6 Curved track.**

- a. Locate the carrier 40 meters before the start of a minimum radius curved track WITH TARGET UP. .
- b. Command the carrier to accelerate to each speed.

- c. The carrier shall negotiate the curve at each speed.

#### **4.2.3.7 Positive brake**

- a. Locate carrier on a 10% slope.
- b. Turn off power.
- c. Carrier shall remain stationary +/- 1/4 revolution of wheel.

#### **Alternate Method**

- a. Position carrier with wheels raised off track and power off.
- b. Turn off power.
- c. Carrier shall remain stationary +/- 1/4 revolution.

#### **4.2.3.8 Duty cycle.**

- a. Locate the EAMTC on a track and command 20 km/hr.
- b. Operate the EAMTC at a duty cycle as defined in 3.2.1.6 for 20 cycles
- c. The EAMTC performance shall not degrade

#### **4.2.3.9 Power loss operation.**

- a. Position the carrier at one end of the track.
- b. Measure the temperature of the mechanical holding brakes.
- c. Command the maximum speed
- d. After the carrier has accelerated for 40 meters, kill power to the track
- e. The carrier shall stop within 30 seconds.

**4.2.3.10 Maintenance interface.** Operate maintenance test switch and observe that the carrier moves a short distance. Repeat the process for the opposite direction.

**4.2.3.11 Speed commands.** During 4.2.3.13 and 4.2.3.14, verify that each of the speeds can be selected by applying a low state on the appropriate input pin.



#### **4.2.3.12 Stop command.**

- a. Position the carrier on the track and command appropriate movement.
- b. Before the carrier reaches the end of track sensor bar, impose an active low signal.
- c. The carrier shall come to a halt.
- d. Impose other speed and direction commands while the stop command is active and the commands must be ignored.

#### **4.2.3.13 Forward command**

- a. With the carrier positioned at other than the forward end, de-assert the stop command.
- b. Assert any speed command
- c. Apply an active low signal.
- d. The carrier shall move to the forward end of track.

#### **4.2.3.14 Reverse command.**

- a. With the carrier positioned at other than the forward end, de-assert the stop command.
- b. Assert any speed command.
- c. Apply an active low signal.
- d. The carrier shall move to the reverse end of track.

#### **4.2.3.15 Forward limit.**

- a. Position the carrier at any position other than the forward end of track.
- b. Repeat 4.2.3.14.
- c. On reaching the forward limit, the carrier shall come to a stop.
- d. A low state shall be measured.

#### **4.2.3.16 Reverse limit.**

- a. Position the carrier at any position other than the reverse end of track.
- b. Repeat 4.2.3.15.
- c. On reaching the forward limit, the carrier shall come to a stop.
- d. A low state shall be measured.

**4.2.3.17 Up command.**

- a. Target is in the DOWN position.
- b. Assert a high state.
- c. The Target Lifter shall raise the target.

**4.2.3.18 Down command.**

- a. Target is in the UP position.
- b. Assert a high state.
- c. The Target Lifter shall lower the target.

**4.2.3.19 Up limit.**

- a. With the target in the UP position
- b. Measure a low state at control unit.

**4.2.3.20 Down limit.**

- a. With the target in the DOWN position
- b. Measure a low state at control unit.

**4.2.3.21 Hit signal.**

- a. Position the target in the UP position
- b. Tap the hit sensor
- c. Measure a positive pulse with a duration of  $25 \pm 5$  milliseconds on J3-H of

the Bunker PDCU.

**4.2.3.22 TKS command.**

- a. Connect a flare simulator to TBD.
- b. Position the target in the UP position.
- c. Assert a LOW state at control unit.
- d. TKS shall actuate the flare simulator.

**4.2.3.23 AHFS command (Replaced by second ATKS)**

- a. Connect a flare simulator to TBD.
- b. TKS shall actuate the flare simulator.

**4.2.3.24 Thermal target.**

- a. Connect a 120 VAC, 500 Watt load to the power conditioner J3 pins B and C.
- b. Assert a HIGH state at control unit.
- c. TKS shall actuate the flare simulator.

**4.2.3.25 Safety interlock and move locator.**

- a. Issue an appropriate speed and direction command to the carrier.
- b. At the carrier, observe that the move indicator gives an aural indication prior to movement of the carrier.
- c. Stop the carrier.
- d. Open the control box on the carrier.
- e. Issue an appropriate move command to the carrier.
- f. Observe that the move indicator gives the maintenance aural indication and that the carrier does not move.

**4.2.3.26 DC Power failure.**

- a. Either position the carrier on a test stand or jack it up off the track.
- b. **Insure that a ground connection is made to the track.**
- c. Command movement.
- d. Interrupt DC power to the supervisory processor.
- e. The carrier shall control to a halt or control the wheels to a halt.

**5. PACKAGING.** For acquisition purposes, the contract or order shall specify packaging requirements. Packaging data is available from the managing Military Department's or Defense's Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## **6. NOTES.**

**6.1 Intended use.** The intended use of the EAMTC is as delineated in paragraph 3 of this specification.

**6.2 Acquisition Requirements.** Acquisition documents must specify the following:

- a. Title, number, and date of this specification, any amendments.
- b. When First Article is required.
- c. Packaging requirements (see para 5).

**6.3 Subject term (keyword) listing.**

Target Carrier	Target Lifter	Remote Target System
Hostile Fire Simulator		

**6.4 List of Acronyms.**

EAMTC	Electric Armor Moving Target Carrier
VDC	Volts Direct Current
VAC	Volts Alternating

**6.5 Specification proponent.** U.S. Army Armament Research, Development and

Engineering Center, ATTN: AMSTA-AR-ESW-D, Rock Island, IL, 61299-7300 (309-782-5778).

**6.6 Inspection Equipment.** Inspection equipment should be submitted to U. S. Army Armament Research, Development and Engineering Center, ATTN: AMSTA-AR-QAC-F. Picatinny Arsenal, N. J. 07801-5000 (973-724-4039).

**PREPARING ACTIVITY:**  
**Army-AR**

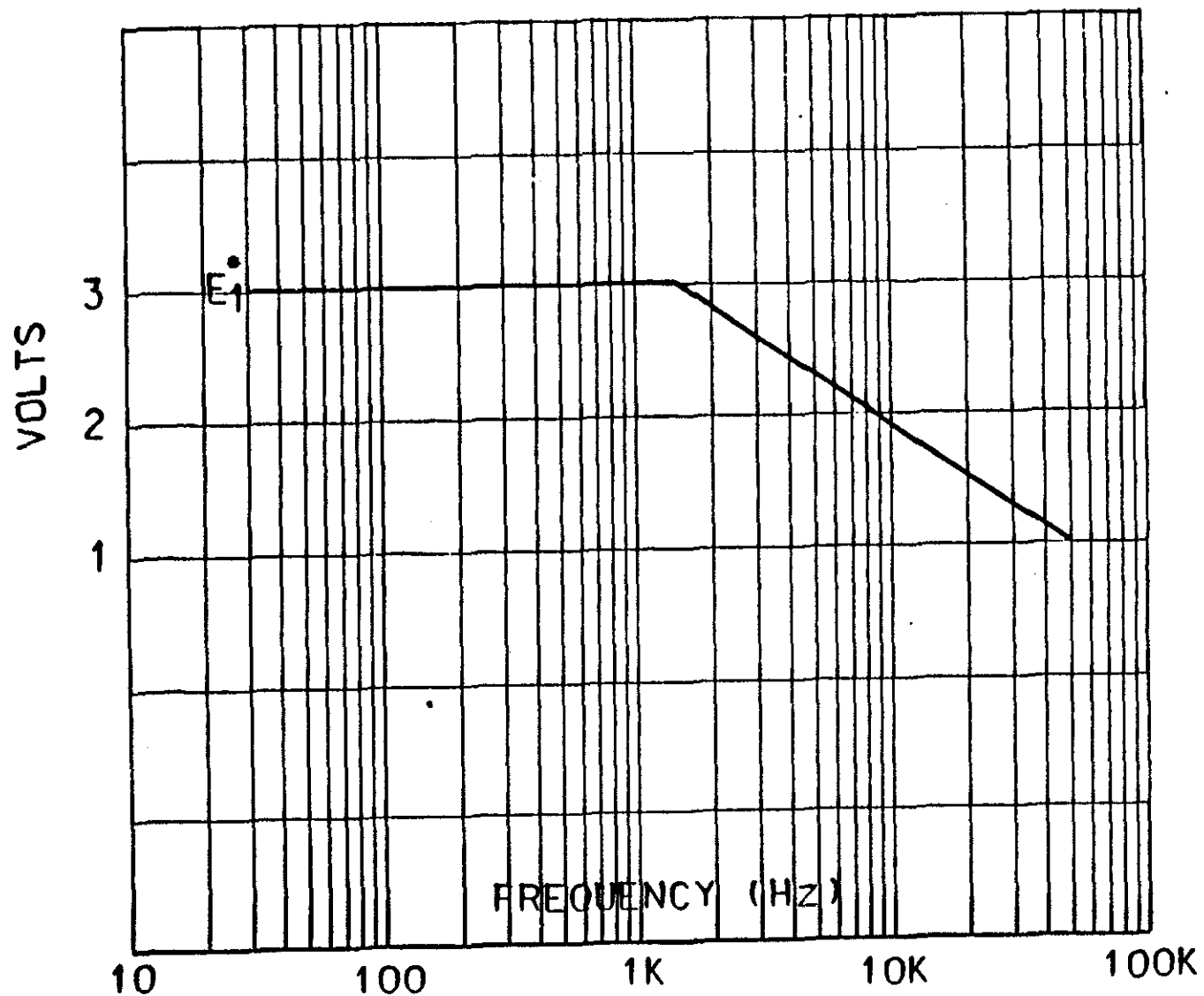
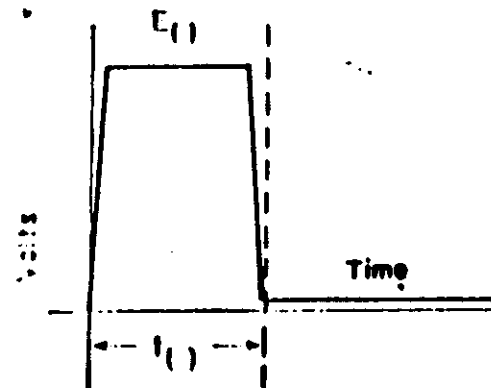
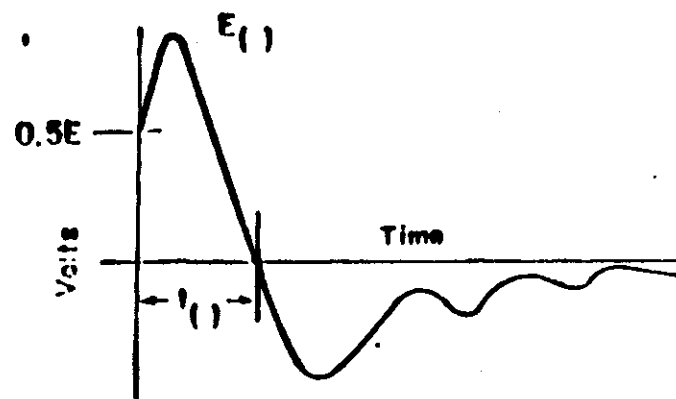


FIGURE 3 - LIMIT FOR CONDUCTED SUSCEPTIBILITY  
TANK TARGET MECHANISM

- $E_1$  = 10% of the supply voltage or 3 volts (rms), whichever is less.  
In no case shall E be less than 1 volt (rms) from 30 Hz to 50 kHz.



**NOTE:** The test sample shall be subjected to the spike(s) with the waveform shown and with the specified voltage(s) and pulsewidth(s).

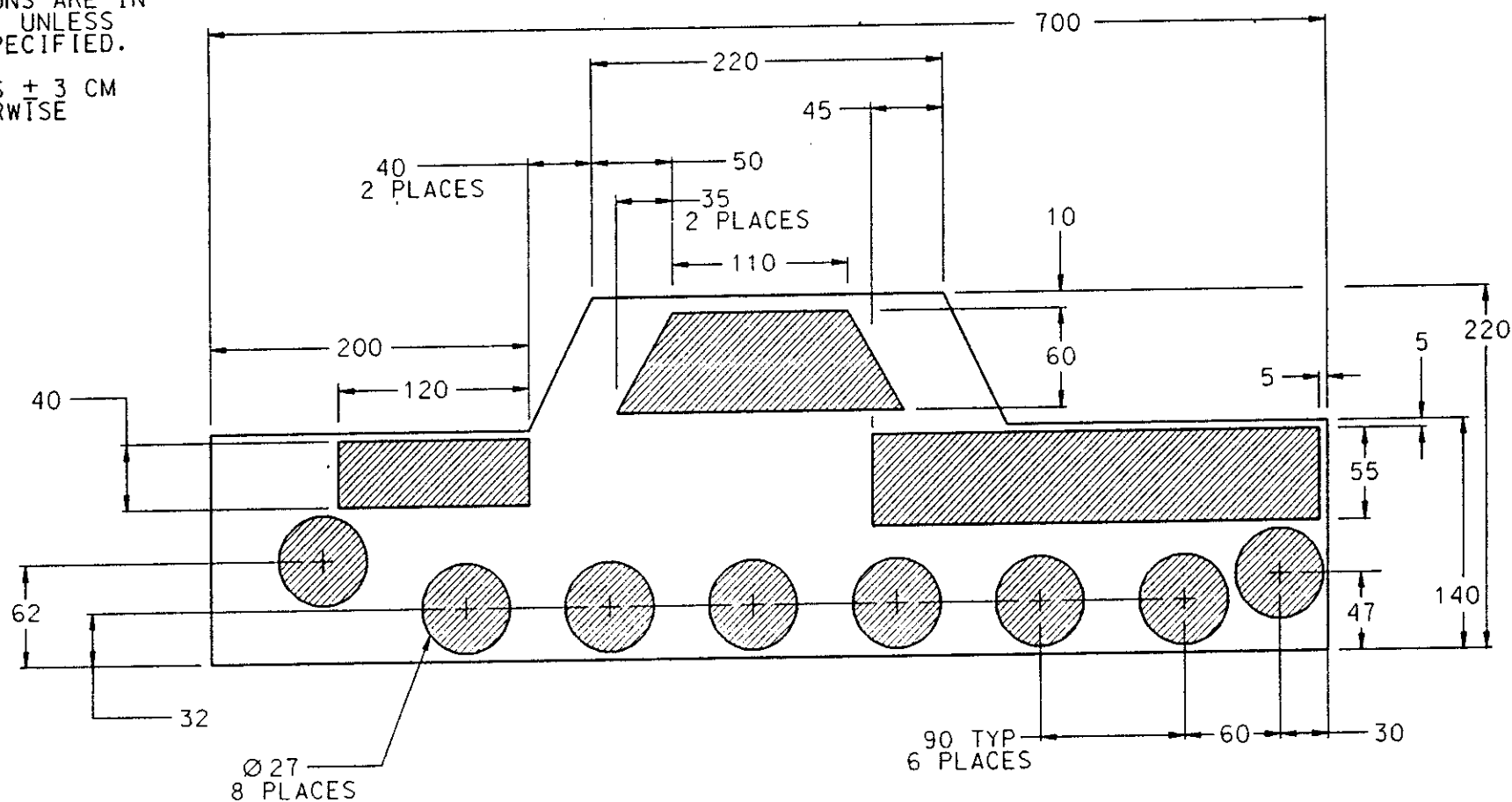
$$E = 400 \text{ volts}$$

$$t = 5 \mu\text{sec} \pm 20\%$$

**FIGURE 4 : ACCEPTABLE WAVESHAPES**

NOTES:

1. SHADED AREA DEFINES THE INFRARED AUGMENTATION PATTERN.
2. ALL DIMENSIONS ARE IN CENTIMETERS, UNLESS OTHERWISE SPECIFIED.
3. TOLERANCE IS  $\pm 3$  CM UNLESS OTHERWISE SPECIFIED.



**T-72 FLANK TARGET**

DRAWING NO.

SCALE: NONE

DATE: 96-03-04

SHEET 1 OF 1

REVISION -